

IN THE CLAIMS:

Kindly amend claims 1-8 and add new claims 9-20 as shown in the following listing of claims, which replaces all previous versions and listings of claims in this application.

1. (currently amended) A method of fabricating a three-dimensional microstructure, comprising the steps of:
~~performing a provisional processing work to create~~
forming a prototypic structure based on in accordance with
~~data about~~ corresponding to a designed three-dimensional shape of the three-dimensional microstructure by scanning a sample with ~~controlling processing conditions used when a beam~~
produced by a charged-particle beam system while controlling
processing conditions thereof is scanned;

comparing the shape of said the formed prototypic structure with said the designed three-dimensional shape of the three-dimensional microstructure to find their identify differences between the shape of the prototypic structure and the designed three-dimensional shape of the three-dimensional microstructure; and

~~performing a non-provisional processing work while~~
~~correcting said processing conditions to correct said~~
~~differences.~~

processing the prototypic structure to correct the
differences identified in the comparing step by scanning the

prototypic structure with a beam produced by the charged-particle beam system while adjusting the processing conditions thereof to thereby fabricate a three-dimensional microstructure having a shape corresponding substantially to the designed three-dimensional shape.

2. (currently amended) A method of fabricating a three-dimensional microstructure as set forth in ~~claim 1~~, wherein ~~said claim 1~~; wherein the processing conditions of said the charged-particle beam system include accelerating voltage, beam current, scan rate, dot-to-dot interval, and dot wait-time duration.

3. (currently amended) A method of fabricating a three-dimensional microstructure as set forth in ~~claim 1~~, wherein ~~said processing conditions are corrected by previously claim 1~~; wherein the step of adjusting the processing conditions comprises the steps of obtaining characteristic data indicating a relation between processed area and deposition rate corresponding to a current of the beam and adjustively adjustably increasing the wait-time duration of the beam scans by a value corresponding to the ratio (decrease in rate value)/(maximum rate value) according to in accordance with a decrease in the deposition rate.

4. (currently amended) A method of fabricating a three-dimensional microstructure as set forth in ~~claim 1~~, wherein ~~said processing conditions are corrected by previously~~ claim 1; wherein the step of adjusting the processing conditions comprises the steps of obtaining characteristic data corresponding to indicating a relation between processed area and deposition rate for each value of the a current of the beam current, first performing a processing the prototypic structure by work using a maximum rate region up to a kink portion of a large beam current, one of the beam current values, switching the beam current to the a next greatest value in the kink portion and using that portion, using this the maximum rate region up to a kink portion of that the beam current with the next greatest value, and repeating the switching the beam current step until the differences obtained from the comparing step are corrected in turn subsequently similarly.

5. (currently amended) A method of fabricating a three-dimensional microstructure as set forth in ~~claim 2~~, wherein ~~said processing conditions are corrected by previously~~ claim 2; wherein the step of adjusting the processing conditions comprises the steps of obtaining characteristic data indicating a relation between processed area and deposition rate corresponding to a current of the beam and adjustively increasing the a number of repetitions of the beam

scan by a value equal to the ratio (decrease in rate value)/(maximum rate value) in accordance with ~~according to~~ a decrease in the deposition rate.

6. (currently amended) A method of fabricating a three-dimensional microstructure as set forth in ~~claim 1~~, wherein ~~CAD data is used as said claim 1~~; wherein the data corresponding to about the designed three-dimensional shape of the three-dimensional microstructure structure, and comprises CAD data; and wherein ~~a processing work is carried out by finding the forming step includes the steps of obtaining plural sets of data corresponding to about plural two-dimensional shapes of the microstructure by differentiation and controlling a position hit scanned by the charged-particle beam based on in accordance with the plural sets of data about the two-dimensional shapes.~~

7. (currently amended) A focused charged-particle beam system used for ~~fabrication of~~ fabricating a three-dimensional microstructure, the focused charged-particle beam system comprising:

data acquisition means for acquiring ~~obtaining~~ data corresponding to about a designed three-dimensional shape of ~~the~~ a three-dimensional microstructure;

first processing means for processing a sample by scanning the sample with a charged-particle beam and for

controlling a position of the sample scanned ~~hit~~ by a the
charged-particle beam ~~based on~~ in accordance with the data
~~about the shape;~~ obtained by the data acquisition means;

control means for controlling processing conditions
including beam energy, beam current, scan rate, dot-to-dot
interval, and dot duration of the charged-particle beam; ~~wait~~
~~time;~~

image acquisition means for ~~obtaining~~ acquiring
images for ~~grasping the~~ determining a three-dimensional shape
of the processed sample structure; and

comparing means for comparing ~~said~~ the images
~~acquired by the image acquisition means with~~ the data acquired
by the data acquisition means to identify differences between
the three-dimensional shape of the processed sample and the
designed three-dimensional shape of the three-dimensional
microstructure ~~said designed three-dimensional shape to find~~
~~their differences in shape;~~ and

second processing means for processing the processed
sample to correct the differences identified by the comparing
means by scanning the processed sample with a charged-particle
beam while adjusting the processing conditions thereof to
thereby fabricate a three-dimensional microstructure having a
shape corresponding substantially to the designed three-
dimensional shape.

~~wherein said processing conditions are corrected based on said differences in shape to thereby fabricate a structure close the designed three-dimensional shape.~~

8. (currently amended) A focused charged-particle beam system ~~used for fabrication of a three-dimensional microstructure as set forth in claim 7, wherein said means for obtaining the data about the designed three-dimensional shape has means for obtaining the data about the designed three-dimensional shape of the three-dimensional structure by entering CAD data, differentiating the data about the three-dimensional data, and finding plural sets of data about two-dimensional shapes perpendicular to the direction of the axis of the beam.~~ claim 7; wherein the data acquired by the data acquisition means comprises CAD data; and wherein the data acquisition means includes means for differentiating the CAD data in a direction generally perpendicular to an axis of the charged-particle beam and for obtaining in accordance with the differentiated CAD data plural sets of data corresponding to two-dimensional shapes of the microstructure.

9. (new) A method of fabricating a three-dimensional microstructure, comprising the steps of:

providing data corresponding to information relating to the structure of a three-dimensional microstructure design;

a first processing step of processing a sample in accordance with the provided data by irradiating the sample with a charged-particle beam while controlling processing conditions of the charged-particle beam;

comparing dimensions of the processed sample with the provided data to identify differences between the structure of the processed sample and the structure of the three-dimensional microstructure design; and

a second processing step of processing the sample by irradiating the sample with a charged-particle beam to correct the structural differences identified in the comparing step while adjusting the processing conditions of the charged-particle beam to thereby fabricate a three-dimensional microstructure having a structure substantially the same as the structure of the three-dimensional microstructure design.

10. (new) A method according to claim 9; wherein the providing step comprises providing CAD data.

11. (new) A method according to claim 9; wherein the processing conditions of the charged-particle beam comprise at least one of an accelerating voltage, current, scan rate, dot-to-dot interval, and dot duration of the charged-particle beam.

12. (new) A method according to claim 9; wherein the providing step includes the step of differentiating the information relating to the structure of the three-dimensional microstructure design in a direction of an axis of the charged-particle beam to provide a plurality of sets of two-dimensional data; and wherein the first processing step comprises the step of processing the sample in accordance with the sets of two-dimensional data while controlling processing conditions of the charged-particle beam.

13. (new) A method according to claim 12; wherein the processing conditions of the charged-particle beam comprise at least one of an accelerating voltage, current, scan rate, dot-to-dot interval, and dot duration of the charged-particle beam.

14. (new) A method according to claim 9; wherein the charged- particle beam comprises a focused ion beam.

15. (new) A method according to claim 9; wherein the information relating to the structure of the three-dimensional microstructure design comprises information relating to at least one of dimensions and a three-dimensional shape of the three-dimensional microstructure design.

16. (new) A focused charged-particle beam system comprising:

acquiring means for acquiring data corresponding to information relating to the structure of a three-dimensional microstructure design;

first processing means for processing a sample in accordance with the data acquired by the acquiring means by irradiating the sample with a charged-particle beam while controlling processing conditions of the charged-particle beam;

comparing means for comparing the sample processed by the first processing means with the data acquired by the acquiring means to identify differences between the structure of the processed sample and the structure of the three-dimensional microstructure design; and

second processing means for processing the sample by irradiating the sample with a charged-particle beam to correct the structural differences identified by the comparing means while adjusting the processing conditions of the charged-particle beam to thereby fabricate a three-dimensional microstructure having a structure substantially the same as the structure of the three-dimensional microstructure design.

17. (new) A focused charged-particle beam system according to claim 16; wherein the data acquired by the acquiring means comprises CAD data.

18. (new) A focused charged-particle beam system according to claim 16; wherein the processing conditions of the charged-particle beam comprise at least one of an accelerating voltage, current, scan rate, dot-to-dot interval, and dot duration of the charged-particle beam.

19. (new) A focused charged-particle beam system according to claim 16; wherein the acquiring means includes means for differentiating the information relating to the structure of the three-dimensional microstructure design in a direction of an axis of the charged-particle beam to provide a plurality of sets of two-dimensional data; and wherein the first processing means includes means for processing the sample in accordance with the sets of two-dimensional data while controlling processing conditions of the charged-particle beam.

20. (new) A focused charged-particle beam system according to claim 19; wherein the processing conditions of the charged-particle beam comprise at least one of an accelerating voltage, current, scan rate, dot-to-dot interval, and dot duration of the charged-particle beam.